

REMARKS

Applicant intends this response to be a complete response to the Examiner's **18 May 2006** Non-Final Office Action. Applicant has labeled the paragraphs in his response to correspond to the paragraph labeling in the Office Action for the convenience of the Examiner.

Preliminary Statement

Due to the nature and of the claim restructuring to address the Examiner's rejection and to help keep trace of claim dependencies, Applicant canceled all but claim 9 and 13. The following table lists the correspondence between the new claims and the old claims for the Examiner's and Applicant's convenience.

old	new	old	new	old	new	old	new
1	28	8	38	15	59	22	54
2	32	9	9	16	60	23	55
3	33	10	30	17	61	24	58
4	34	11	35	18	56	25	29
5	35	12	33	19	55	26	31
6	36	13	13	20	31	27	39
7	37	14	57	21	53		

Claim Rejections - 35 USC § 112

Claims 1-2, 6-8, 10, 13-14, 17 and 19-20 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner contends as follows:

Claim 1 is vague and indefinite what structure is intended to accomplish the claimed "...where the UV interference reduction system is adapted to prevent, interference from nitrogen...".

Claims 15 -17 are duplicates of each other.

Applicant has canceled claims 1-2, 6-8, 10, 14, 17, and 19-20 and replaced them with claim 28-61 according to the above claim correspondence table. Applicant believes that the new claims 28, 40 and 53 address the issue concerning the descriptions of the "UV interference reduction system." Applicant, therefore, respectfully requests withdrawal of these section 112, second paragraph rejection.

Claim Rejections - 35 USC § 102

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Claims 1, 2, 6-8, 10, 13-14, 17 and 19-27 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Wreyford ('963).

The Examiner contends as follows:

See the appropriate paragraph of the 10/18/05 final Office action. With respect to the new claim language "...where the UV interference reduction system is adapted to prevent interference from nitrogen...", in light of the above 35 USC 112 second paragraph issues, it is not clear how the system has been adapted. For the purposes of examination, it will be assumed, until otherwise claimed, the "adaptor" has been read on the means of Wreyford that connects (e.g. adapts) the ozone generator to the system.

Applicant has canceled all but claims 9 and 13. The previously pending claims are related based on the above claim correspondence table.

Wreyford is a two species analytical instrument. The Wreyford apparatus includes a combustion tube connected to a valve which can send the combustion products to one of two detection chambers. One chamber utilizes UV light to detect sulfur (excited SO₂ fluorescence) and the other chamber uses ozone to convert NO to excited NO₂ producing chemiluminescent light.

Although the analytic device can be operated so that the effluent from one chamber can flow to the other chamber, Wreyford does not disclose that the influent to the sulfur UV chamber have had a sufficient amount of a nitric oxide reactive species such as ozone introduced into the influent to it to reduce or eliminate nitric oxide (NO), a nitrogen oxide that interferes with sulfur detection so that sulfur can be detected at concentrations below 100 ppb (parts per billion). At the sulfure levels being detected by Wreyford, NO present in the influent to the sulfur UV chamber would not present a detection problem for sulfur. Wreyford discloses and teaches that it matters not which detection is done first. In fact, Wreyford analyzes for sulfur without passing the combustion tube effluent through the chemiluminescence chamber, where the ozone would be added, as set forth in claim 1 of Wreyford.

Wreyford simply does not disclose or even suggest that a nitric oxide reduction agent such as ozone **must have been added to the influent to the UV chamber so that the instrument is capable of detecting sulfur at concentrations below 100 ppb**. In fact, Wreyford discloses that his system is capable of "a very wide dynamic range, for instance, the range is thought to extend as high as perhaps 20 to 25 percent sulfur and is believed reasonably accurate to less than about 0.5 ppm." Thus, in Wreyford's own words, his instrument is **only believed to be reasonably accurate to less than about 500 ppb**, a sulfur content 5 times higher than the concentration where nitric oxide interference is even observable.

The problem solve by the present invention is that when going below 500 ppb, trace amounts NO formed in the combustion chamber either from nitrogen in the oxidizing agent or from other sources (leaks, nitrogen in the sample, *etc.*) interfere with sulfur detection to give widely unpredictable and irreproducible results as shown in the present specification. Wreyford knew nothing of this problem. Wreyford did not know that NO would interfere with sulfur detection at concentration below 100 ppb. In fact, Wreyford discloses, teaches or suggests no technique for measuring sulfur below 100 ppb.

This problem was solved by the present invention. The present invention requires that a nitric oxide reduction agent such as ozone have been added to the influent to the UV chamber. The present invention is the only device that allows reliable detection of sulfur at levels below 100 ppb using UV fluorescent, because the present invention solves a problem that was not known in the prior art – when measuring sulfur at levels below 100 ppb, NO formed during combustion must be removed regardless of the source of the gas.

Because Wreyford does not disclose that a nitric oxide reduction agent must have been added to the UV chamber influent to detect sulfur reliably and reproducibly at concentration below 100 ppb, Wreyford cannot anticipate the present claims.

Claim Rejections - 35 USC § 103

Claims 3-5,9,15-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wreyford.

The Examiner contends as follows:

See the appropriate paragraph of the 10/18/05 final Office action.

Again, Wreyford does not disclose, teach or suggest the introduction of a UV interference reduction agent into the oxidized sample prior to UV fluorescent is absolutely necessary to lower the sulfur detection limit to concentration below 100 ppb as stated above. Thus, Wreyford does not render the present claims obvious, and, Applicant, therefore, respectfully requests withdrawal of this section 103 rejection.

Response to Arguments

The Examiner contends as follows:

Applicant's arguments filed 1/17/06 have been fully considered but they are not persuasive.

Applicants' state Wreyford does not detect sulfur below 500 ppb. Wreyford teaches in column 1 lines 47-48 teaches accuracy to less than 500 ppb which has been properly read on the claimed at or below 100 ppb. Applicants' state Wreyford fails to teach detection of atmospheric nitrogen. This has been read on the claimed elimination of interference from nitrogen oxides:

Applicants' assert teachings of Wreyford are incorrect. These remarks are not convincing. Applicants' should consult MPEP section 716.07 on how to challenge the validity of statements made within a patent.

Applicants' state Wreyford does not use ozone to remove interfering NO. The Office maintains Wreyford teaches an identical structure and method as that claimed and has been properly read on the instant claims.

Applicants' state Wreyford does not teach an UV interference reduction system. The original specification teaches (exemplary is paragraph [0013]) an ozone generator to reduce the UV interference. Wreyford clearly teaches and ozone generator and has been properly read on the instant claims.

Applicants' state Wreyford does not permit reliable UV fluorescence detection of sulfur levels at or below 100 ppb. The Office has read detection of the claimed levels of sulfur on the teachings of column 1 lines 47-48 described above.

Applicants' traverse the 35 USC 103 rejections on the basis the above 35 USC 102 rejections are incorrect. The Office maintains all of the rejections of record are correct.

Applicant believes that new claims 28-61 address these issues.

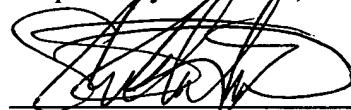
Having fully responded to the Examiner's Non-Final Office Action, Applicant respectfully urges that this application be passed onto allowance.

The Commissioner is authorized to charge any additional fees or credit in overpayments to Deposit Account No. 501518.

If it would be of assistance in resolving any issues in this application, the Examiner is kindly invited to contact applicant's attorney Robert W. Strozier at 713.977.7000

Date: October 16, 2006

Respectfully submitted,



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